AMERICAN ACADEMY OF DENTAL MEDICINE
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JULY, 1951

Journal of DENTAL MEDICINE

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Vol. 6 • No. 3

OBJECTIVES OF THE AMERICAN ACADEMY OF DENTAL MEDICINE

(Quoted from the Constitution)

"To promote the study and dissemination of knowledge of the cause, prevention and control of diseases of the teeth, their supporting structures and adnexa and related subjects; and to foster and promote a better scientific understanding between the fields of dentistry and medicine."

THE JOURNAL OF DENTAL MEDICINE

Published by

The American Academy of Dental Medicine

Volume 6 July 1951 Number 3

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Published quarterly at New York, N. Y.

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Subscription $3.00 Yearly

Single copies, $1.00

Publication in the Journal of Dental Medicine is not an endorsement by the American Academy of Dental Medicine of opinions in any article, abstract or extract. The Editor and Publisher are not responsible for opinions expressed by authors of contributions.

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PROBLEMS OF OLD AGE AND THEIR TREATMENT*

HARRY BENJAMIN, M.D., *New York, N. Y.*

SOCIOLOGICAL ASPECTS

At no time in the past have the problems of old age drawn as much attention as they do now. This is because of the well-known fact that so many more people reach an advanced age than ever before. Even without further medical progress it has been estimated that in about thirty years, 14 per cent of us may be sixty-five years, or older. One hundred years ago that percentage was only 2½. In actual figures that would mean that in 1980, people of sixty-five or over would number approximately 22 million in the United States, as compared to 9 million in 1940.

The striking increase in life expectancy has been much publicized. Since the beginning of the century when this expectancy was about forty-seven years in the United States, it has risen to more than sixty-eight for men and to over seventy for women. All this is due to the advances in medicine. In Caesar's day a new-born baby had a chance to live only twenty-one years. And it probably was not much more in the time of Columbus. This low figure was due to the high mortality of infants. The enormous increase in the life span proves the success of pediatrics. Imagine how the conquest of cancer and the successful treatment of arteriosclerosis will further increase life expectancy.

Parenthetically it may be noted that such a large number of aging people may well constitute the balance of power in any election. If they should band together as a special interest group, a conflict of age versus youth, retired people versus working people, could well become a reality and worry our politicians no end.

When we consider this large number of aged people, remembering at the same time that the age of retirement for men as well as women is still generally sixty or sixty-five, just as it used to be, we are faced with a further disturbing fact that an ever-increasing number of non-productive older people must be supported by the younger generation. According to recent statistics, only 20 per cent of people over sixty-five are self-supporting through investments, pensions, etc. The other 80 per cent must be supported by others. It has been estimated that in about twenty-five years, 40 million people will be responsible for the support of probably thrice their number, that is to say, 120 million. However, in view of a sharp increase in pension plans in recent years, and more and more social security for many people, this estimate may be too high.

The shift in the population toward the higher age brackets is paralleled by the shift of the period called middle age. Men and women who were "middle aged" a hundred or even fifty years ago, are now in a much more youthful period of life. Only a few generations ago a man, and especially a woman, of fifty was no longer middle aged as today, but definitely old. Nowadays middle age extends for many people to nearly seventy. These two parallel facts are frequently overlooked, but merit consideration.

There seems to be only one logical solution to the problem posed by a "nation of elders," and it is necessarily only partial. Special occupations will have to be created or set aside that can be filled by those who want to continue in their work but are now considered unemployable because of age. Certain jobs now filled by younger men could and should be reserved for their elders. The illogical, unjust, and arbitrary "age of retirement" at sixty or sixty-five must be abandoned.

True enough there is a justification for this rule of retirement in large corporations: It allows the promotion of younger men to higher positions who would otherwise be discouraged with their prospects. Yet it seems so illogical and wasteful to compel a man to retire at sixty-five, when he may be at the peak of his ability and usefulness. Would it not be wiser to

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* Read before the N. Y. Section of the American Academy of Dental Medicine.

determine retirement age not by the years a person has lived, but by his or her faculties, and let a thorough medical examination estimate his age instead of having it determined by the calendar?

BIOLOGICAL VERSUS CHRONOLOGICAL AGE

I feel that whoever wants to work, and is competent enough, should have the opportunity to do so without counting birthday anniversaries. Our age is not determined by the number of years that we have lived. It is determined by our state of health and functioning capacity, which constitutes our true, biological age. Our chronological age is controlled by the calendar. It is unalterable and rigid. Biological age is flexible, as our state of health is subject to changes.

The designation biological age is also referred to as physiological age. But since it is customary to oppose the term physiological with pathological, and since the chronological age has nothing to do with pathology, it seems more appropriate to speak of biological age. With many people however habit is stronger than logic, and therefore the term "physiological age" will probably continue to be used.

An approximate estimation of a person's biological age is possible through what is essentially a health inventory.[1] It is as yet complicated, but future studies dealing with the aging of various organs and organ groups may simplify the method sufficiently to make it universally applicable.

BIOLOGIC AGE ESTIMATION

At present we could select a certain number of factors out of twenty, and investigate them through interrogation and examination. Especially important among these factors are heredity, living habits, metabolism, the nervous and the endocrine system, and most important of all, the cardio-vascular apparatus. The mental and sexual functions likewise play their role in estimating biological age, and also the genito-urinary and digestive apparatus, etc. Eyes, ears, skin, hair play minor parts, and so do the oral cavity, the teeth and the jaws. A person can be blind or deaf (with no teeth of his own) and yet be generally healthy and biologically younger than his years.

In biological age estimation, each individual factor that does not appear average or normal for the person's chronological age is evaluated as to its state of health, but the estimate is made indirectly by raising or lowering the chronological age for this particular factor. Take, for instance, a man who has lived seventy years. He has a perfectly healthy cardiovascular system, that is to say normal blood pressure, normal pulse, no sign of arteriosclerosis, etc. This healthy cardiovascular system could lower his chronological age by as many as thirty years. From a point of view of his heart and arteries, etc., this man is therefore only forty biologically. But then, he may have an unfavorable heredity, his parents and grandparents having died at a relatively early age. That would reduce some of the gain and raise his biological age by ten or twenty years. Or he may be greatly overweight, or he may have a defective nervous system, which are both important factors. Again some of the advantage derived from the healthy cardiovascular system would be offset. In this way several factors are estimated — rarely more than ten out of twenty—and for each factor years are added (which is unfavorable) or deducted (which is favorable) from the chronological age.

By a simple mathematical calculation (adding up the figures that were estimated and dividing the total by their number) a final figure is derived at which is the approximate biologic age.

An estimation of the biological age is useless in a seriously sick person, who would be biologically as old as his sickest organ.

THE ORAL CAVITY

The state of the oral cavity, of the teeth and the jaws would modify the chronological age by perhaps five years. Even if a person has lost all his teeth early in life, or shows other signs of aging in the mouth in the form of atrophic conditions,

that does not necessarily affect his general health, for he may, with all his teeth lost at forty, live to a healthy old age of eighty or more, (provided of course he had a good dentist and is wearing proper dentures.)

In judging the oral cavity, attention should be paid to actual diseases, like root abscesses, periodontal disease, and the stamina of the tissues, which depend so much on the person's general health and are so important for proper dental prosthetics.

Statistics tell us that at the age of sixty, 40 per cent of the people have lost all of their teeth. If an individual has lost more or has lost 40 per cent at an earlier age, that would give him a slightly unfavorable mark in his rating. If, however, he has lost decidedly fewer teeth, that would be to his advantage in estimating his biological age.

Diminution of facial measurements and atrophic changes of the jaws are due to loss of musculatory function in consequence of loss of teeth. Dentures worn in time would prevent these senile changes. Dentists would do well to always remind their patients of this fact when they fit them with their first denture. Otherwise dentures may well become instruments of psychosomatic injury for those who fear nothing more than growing old and see in "false teeth" the first sign of it.

UNEQUAL AGING OF ORGANS

Let me repeat that a premature or pronounced aging of one organ does not necessarily reflect on the general health of the person, unless the respective organs are of vital importance, like arteries, kidneys, etc.

Estimating the biological age, for instance, by certain changes in the lens of the eye can be very deceiving. A person may well have prematurely old eyes but may otherwise be quite young biologically. Therefore—at least at present—the biological age of a person cannot be estimated by the condition of one organ alone.

One of the great tragedies in life is the unequal aging of various organs. Active, youthful mental functions may go with myocardial degeneration. On the other hand a healthy cardiovascular system may exist together with complete senile dementia, thus preserving nothing but the life of a human vegetable. Our institutions for the chronically ill are filled with such people.

THE APPARENT AGE

In addition to the chronological and the biological age, a third age could be thought of, although it may have little scientific meaning and you will probably never read about it in a medical textbook. It may be called the symptomatic, or the apparent age. It is the answer to the eternal question: "How old do you think I am?" or rather, "How old do I look?" It is a most deceiving age because it is so often deliberately altered. A number of factors can either lower or raise this age of appearance.

It is self-understood, and a matter not only of appearance but also of health, to replace missing teeth and to see to it that proper type of restorations prevent senile retraction of lips and other visible senile deformations.

Another factor concerns the hair, whose natural color can be so cleverly camouflaged. Gray hair as well as baldness is less deceiving in judging a person's age than very white hair. We are used to seeing prematurely gray hair or bald heads in relatively young people. But snow-white hair is ordinarily not expected until the 70's or 80's. But even the whitest hair can go with a much lower biological or chronological age.

The same applies to a wrinkled skin, which may merely indicate that the skin tissue has aged earlier, or more so than other tissues.

A slumping, careless posture, as well as many uncontrolled senile mannerisms and forms of behavior, may likewise let a person appear older than his years or his general health would justify. Furthermore we all know how grief and worry can age a person temporarily. This may apply not only to appearance but also to the

biological age, by depleting nervous and mental energy.

In the other happier direction, that is to say downward, the apparent age can be considerably reduced by cosmetic procedures, including plastic surgery, as every woman knows. I need not go into details. While this type of rejuvenation may be only "skin deep," the efforts to appear younger nevertheless have a logical justification in our age of competition. They raise morale. Compare a happy person with an unhappy, depressed one, and the difference is clear.

Less appreciated than the use of hair dyes, facial creams, etc., etc., is the fact that conscious efforts can be made in practicing controlled youthful behavior, and in purposely avoiding the mannerisms of old people.[2] But care must be taken not to let the actions appear forced and artificial. Otherwise the effect may be the opposite. All of us have observed the difference in how young and old people sit down or get up from an armchair. Doing so without lowering or raising one's self slowly may deduct as much as twenty years from one's symptomatic age at this moment, provided the actions appear natural. A straight posture, a gait with a spring in it, and quick movements look more youthful than the opposite. During a conversation, speaking to the point without repeating and without deviating, are attributes of youth, and so is a constant awareness and paying attention to what somebody else has to say.

Important also is *what* we say, not only *how* we say it. Dwelling on the past is the habit of old people. The young live in the present and in the future.

A woman may be as old as she looks, and a man as old as he feels. Both can be said to be as old as their habits. Now let me return to a more scientific aspect.

THE TREATMENT OF AGING

Medical treatment and a healthier mode of living can lower a person's biological age. That would amount to a degree of rejuvenation. To accomplish such prolongation of a person's active and useful period of life, medical science has two principal assignments.[3]

There is, first, the prevention and treatment of diseases incident to old age. This field of medicine is called geriatrics. It includes the hygiene of advancing years, especially nutrition, and also a careful search and removal of any possible focal infection. Secondly, and this is a more recent development in medicine, the aging process as such can be treated. Such treatment is termed gerontotherapy.[4]

The idea is still sometimes found in the medical literature, perhaps only in a rudimentary form or by innuendo, that the only scientific way to take care of an aging or old patient is to treat the symptoms and tell him to take it easy, and eat the right things. Anything beyond that would not be justified—may even approach quackery. Such an attitude is erroneous and reactionary to the extreme.

Gerontotherapy does not mean that old age should be treated like a disease. Old age is not a disease, but a natural period of human life, a stage of evolution, like childhood and adolescence. Everybody who lives long enough will—sooner or later—reach old age. Only those who die early escape. Therefore old age is inevitable. Disease is not. Diseases can be prevented and cured. Old age can only be retarded in its onset and ameliorated in its symptoms. That is what gerontotherapy is attempting to do. It is trying to produce better, that is to say, healthier old people, whereas so far medicine has only produced more old people. Gerontotherapy aims to extend the useful and youthful part of life. (You can spell it both ways and it makes sense.) Its object is to allow people to have happier and healthier birthdays, and not just more of them. It is the active, healthy middle age span that we want to prolong at the expense of the period of old age.

While no sharp line can be drawn between gerontotherapy and geriatrics, it can be suggested that geriatrics is more concerned with adding years to life, and gerontotherapy more with adding life to years.* (May I be pardoned for repeating

these expressions, which have become almost a cliché.)

ENDOCRINE GERONTOTHERAPY

The principal methods used in gerontotherapy are concerned with the functions of the endocrine system. Our endocrine glands are not causing old age when they decline in their function. The endocrines are not responsible for the "why" of aging, but they do influence the "when" and the "how." A well-functioning endocrine system may retard the aging process and prevent many of its symptoms. When we see a very healthy youthful man of seventy, or more, we may ascribe much of his good fortune to an active well-balanced endocrine system. This, in turn, may be attributable to his inheritance. He has been careful to select parents with an equally superior endocrine system. Compare with him the prematurely aged man of forty-five or fifty, ailing without any actual illness, or low vitality and with practically no zest for living. The cause of his misfortune may well lie in his inferior glandular functions. Naturally inheritance does not explain everything. The stresses and the wear and tear of life, as well as the mode of living, can decidedly influence the manner in which we grow old. And so can—within modest limits — gerontotherapy, or — better — endocrine gerontotherapy.

The hormones used in this therapy of aging are chiefly the so-called steroid hormones, that is to say the hormones of the testes, ovaries, and adrenal glands. Reference to the testicular and ovarian hormones as sex hormones is incorrect. They are more than that. By influencing the metabolism, especially the protein metabolism, they have a very definite nonsexual character. It is also necessary to correct the false term of "male" and "female" hormones. It is better to speak of androgens and estrogens. Both hormones exist in the male as well as the female. There is no Adam without an element of Eve; and no Eve without a sprinkling of Adam.

The steroid hormones are by far the most important weapons against the aging process as such. They are almost specific in the menopause as well as in the male climacteric. These two conditions are both the result of sex gland deficiency and are part of the aging process. Their treatment constitutes a typical example of gerontotherapy.

In addition, the aging or aged person must be treated for any existing chronic illness. The two systems of therapy, gerontotherapy and geriatrics, should be combined in many instances. A sharp separation is not aways possible. To these strictly medical problems must be added recommendations as to the general mode of living, proper nutrition being the prime consideration, more periods of rest and relaxation second. In an old person, both a vitamin as well as a hormone deficiency must be assumed *a priori*. Examinations can determine which hormone or hormones and which vitamins should be prescribed. The oral cavity can provide valuable clues, especially with respect to deficiencies in calcium, Vitamins A, C and B.

In the Vitamin B Complex group, Inositol or Choline are especially recommended, together with certain amino acids. They influence liver function and the fat and cholesterol metabolism. They are considered useful in the prevention of arteriosclerosis.

In actual practice, a course of gerontotherapy usually consists in a series of twenty to twenty-five injections of single or—more often—balanced multiple steroids. In men, androgens are very often combined with a small dose of estrogens. In women, an androgen is administered with estrogen, mainly for its anabolic effect. The hormone solutions are combined in the same syringe and injected simultaneously with or without added vitamins.

Almost all old age symptoms are associated with or caused by improper circulation. The steroid hormones by themselves produce many of their favorable effects by improving circulation, relaxing the capillaries and arterioles. There is a definite

* For the often queried origin of this phrase, see J. Gerontol. 5:60 (Jan.) 1950.

advantage in re-enforcing the effect by treatment with short-wave diathermy, generating heat in the tissues. The use of hormone tablets, especially those that are absorbed from the mucous membrane of the mouth, are likewise helpful, but in actual practice not as effective as injections.

The series of treatments outlined above can be repeated once or twice a year depending upon individual requirements.

CLINICAL RESULTS OF GERONTOTHERAPY

The clinical results of gerontotherapy are decidedly gratifying, provided neither doctor nor patient entertain exaggerated expectations of actual rejuvenation. In a recent series of observations in 88 female patients, reported in the Journal of Gerontology,[5] 85 per cent definitely benefited. In 50 male patients treated mostly with combined hormone injections, the results were either good or excellent in 87 per cent of the cases.[6] The average age of these men was slightly over sixty. An improvement of sexual functions was noted in 67 per cent.

In men the concern with potency is just as frequent as the interest in their appearance is in women. A cosmetic effect is definitely possible in women, especially if estrogens are also applied to the face in the form of creams. Their absorption by the skin and their favorable influence on skin tone and circulation has been well established.[7]

The decline of potency is frequently the first and foremost symptom that makes a man believe he is getting old. It worries him more than anything else.

Endocrine treatment is indeed logical in potency disturbances in and past middle age. Their cause is usually glandular, although the secondary psychological element should not be forgotten.[8] The dosage in hormonal treatment of impotence is of greatest importance. Too much may be harmful and as ineffective as too little.

A word should be said here about the much publicized danger of producing cancer through hormone treatments. As usual, in such cases the danger has been greatly exaggerated. Large doses of testosterone, larger than usually employed, can stimulate existing cancer cells in the prostate to grow more rapidly, but there is no evidence whatever that prostatic cancer can be produced by testosterone. Naturally the prostate should always be examined before testosterone is used.

A similar situation exists in women. Estrogen can accelerate the growth of an existing cancer in the sex organs, including the breasts. Therefore, caution is necessary in treating women who have had cancer and may still harbor cancer cells, and also in women who come from a cancer-prone family. In a healthy woman, cancer will not be produced by estrogens. The doses commonly employed in gerontotherapy are safe under ordinary precautions, and the combination of hormones may constitute an additional protection.

How long now can gerontotherapy and geriatrics extend man's platform of efficiency? This question is just as unanswerable as "how old is old?." No actual figure can supply the answer. With or without gerontotherapy one man may be active and useful at eighty, and another may have to quit at fifty or sixty. But those who receive treatment and take care of their health have a better chance.

THE YEARS OF FULFILLMENT

As indicated previously, a man in good health should never retire voluntarily. If he is forced to do so under our present ill-considered system, he should seek employment elsewhere, or at least acquire a hobby that can let him live happily. Idleness is dangerous; it may kill him before his time. Impaired health alone, whether through illness or old age, should justify retirement. Then new problems arise for which our present society has not yet found a solution. Who will take care of the unemployable old people, and where shall they live? This is not the place to discuss these problems in detail. Besides, I am sure I do not know all the answers. Therefore I shall confine myself to a few casual remarks:

There is not much of a problem for the wealthy. They can have all the care they need in sanatoriums at $100 or $200

weekly, or live with relatives having enough space and service to avoid friction. But what about those that cannot afford such luxuries? It is distressing to see how often parents or grandparents living idly with their children are the innocent cause of much misery, or broken marriages, and of open hostility between relatives. The medical profession has hardly begun to take an interest in these problems. If more medium- or low-priced homes for old people were available where they could maintain their accustomed standard of living, it would be a blessing for many families. I do not like the designation of "homes" for old people. I think a term like "retirement clubs" would be infinitely better. People do not like to be called "old" or "aged," but they would not mind being "retired" living in a "club."

Such places could not only provide proper care by experienced personnel, but would relieve lonesomeness, the greatest enemy of old people. Great and laudable efforts are being made by federal and state agencies as well as by private organizations to find a solution.

In spite of all our medical efforts, senility cannot be staved off indefinitely, nor can the diseases of old age be prevented that are probably always the cause of death. It is then up to the medical profession not only to relieve suffering (which is paramount) but also to think of the family. Should we not question the wisdom and humanity of prolonging life only for life's sake in such terminal periods, when we can hardly speak of living, any more? Are we justified, and is it ethical, to use stimulants, blood transfusions, artificial feeding, to prolong a hopeless struggle (creating victims of medical skill instead of beneficiaries) and incidentally often bankrupt the family? I am merely posing the question. If some of us condemn euthanasia and its legalization, must we also reject euthanasia—by—omission which we would practice when we allow nature to take its course? In other words: If we cannot extend living, must we extend dying?

Let me conclude with a somewhat more cheerful note. George Bernard Shaw is credited with having said that the trouble with youth is that it is wasted on the young. The trouble with old age is that it is so unevenly distributed. Only old people suffer from it. The young never do, and therefore they usually lack understanding of and sympathy with their parents and grandparents. This shortcoming, I am afraid, will have to be borne philosophically, although I am far from discouraging all the educational efforts dealing with old age problems which fill newspapers and magazines these days. In that respect we are somewhat better off than people were in the time of Victor Hugo, who said, "The misery of a child is interesting to a mother. The misery of a young man is interesting to a woman. The misery of an old man is interesting to nobody."

Finally, let us remember that every period in life has its own satisfactions and pleasures. The period called old age is no exception, but we must learn to find and enjoy these satisfactions, compensations and pleasures. Then the declining years dreaded by too many as the "winter of our discontent" can be faced with equinimity, and its disadvantages, discomforts and annoyances can be borne with the patience of a philosopher.

The years of late maturity are the years of fulfillment, the harvest years of the soul. Even if the actor on the stage of life has become more and more a spectator, life can still be interesting and enjoyable provided we learn to evaluate these late years in their own terms and not in the terms of youth.

728 Park Avenue

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Discussion by LOUIS R. BURMAN, Ph.G., D.D.S., *New York, N. Y.*

It is a privilege to be present on an occasion when so fine a paper is presented. In as much as we too are not getting any younger, a discourse on the problems of aging and of older persons should be of as much interest to us as individuals as it is to us in the case of our patients.

In some respects, the dentist has a man-made advantage over the physician in that he can confine his activities to a limited part of the body. The alert practitioner, however, does not consider this advantage because he knows that the mouth is an integral part of the human system and is affected by aterations in distant and closer parts of the body. Similarly, dysfunctions of the mouth can and do adversely affect the system, and while one may be toothless and healthy, still early loss of teeth may hasten the aging process, as has been so well pointed out.

All of the problems of aging and senescence mentioned by Dr. Benjamin as affecting various parts and organs of the body also hold true for the dental apparatus. In addition to what our essayist has mentioned, may I quote Cowdry[2] who states that, "It is no longer a question of finding ways and means of prolonging life, but more importantly of learning how to conserve the health, vitality and functional efficiency of individuals so that they will not be subject, as they grow older, to the many handicaps and impairments that so often cloud and burden the later years of life."

Gerodontia may be defined as, "that department of dentistry which treats all problems peculiar to the oral cavity during aging and in old age, including the clinical problems of senescence and senility." By definition, therefore, it becomes the duty of the dentist to see that oral health goes hand in hand with the health of the rest of the body.

It is important to realize that the aging process need not adversely affect the masticatory apparatus provided there are no disabling systemic diseases present. There need be no loss of teeth throughout life. If the teeth can be retained, the vertical dimensions and facial contours may be sustained indefinitely and the muscle tone will remain good. This is true even with the normal changes which take place throughout the years. Thus we need not worry about biologic and chronologic age as far as the mouth is concerned.

The references made by Dr. Benjamin to the effects of hormonal and vitamin actions on the aging process are well taken. With the increased tone of the body, the mouth too will respond with the benefits of this systemic gerontotherapy. This therapy is supportive in nature. Our essayist does not intend us to believe that we are treating some disease or ailment. It is interesting to note that we dentists can help the physician immeasurably by maintaining good oral health in aging individuals.

Just as the pediatrician begins the care of the child at birth, so we must begin the care of the oral health as soon as we can get a child to open his mouth for examination. We will all agree that the aging process begins at birth, or more accurately, when the sperm activates the egg. Growth and development are part of the aging process, and when the peak has been reached, the decline begins. All through the years antagonistic forces are at work, establishing an equilibrium. In later years this equality is disturbed and is replaced by a maintaining metabolism whch becomes less effective as time goes on.

I like to think that Gerontotherapy and Gerodontotherapy are preventive in nature and therefore should be begun early in life. What we dentists can do along this line of endeavor is quite simple. We must practice preventative dentistry. There must be:

1. Periodic examinations with roentgenograms beginning with the advent of deciduous teeth.
2. Early correction of caries.
3. Early correction of abnormal developments of teeth and jaws.

4. Periodontal examination and correction throughout the life span.
5. Maintenance of good oral hygiene.

There are many changes which normally take place in growth and development and we must make corrections when they are needed, for example, if the teeth wear naturally and present broad occlusal surfaces, narrow them down and recarve the tooth anatomy to reduce stress and strains, on the other hand a glossopyrosis due to change of life may be helped by proper treatment with vitamins and/or hormones.

It is not my purpose to detail each procedure in the dental field that can help an individual. You all know what is expected in preventive dentistry. What is important is that we educate the patient to the need for this type of therapy and see to it that it is done properly.

It might be a good thing to remember a few cardinal principles of treatment when working with aged, or older individuals. These are:

1. The old do not heal as rapidly as the young,
2. they need a longer period of rest or recuperation,
3. they should not be kept in bed or inactive too long,
4. they should not be kept idle too long,
5. they should especially be protected from infectious diseases,
6. they have a greater fear of dying,
7. they tend towards constipation with its accompanying disorders, and
8. they do not tolerate long drawn out procedures too well.

We must not neglect to mention the psychosomatic effects upon edentulous or orally mutilated individuals. They shun society, become morbid and discontent, and are not easy individuals with whom to associate. In the interest of the patient we must see that they are happy and content in later years, useful to society and that they have a full complement of teeth. Esthetically, socially and functionally we can make all individuals more satisfied with their declining years. In this field of endeavor, the physician and dentist have a common meeting ground and a fertile field for a cooperative endeavor.

1749 Grand Concourse

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If you don't claim too much wisdom, people will give you credit for more than you have.

A STUDY OF THE KERATINIZATION OF THE ORAL MUCOSA OF AGED MALES*

RUGERPE A. PEDREIRA, D.D.S., *Rio De Janeiro, Brazil*

The present investigation was undertaken for the purpose of determining whether a definite pattern of keratinization exists in the oral mucosa of aged males.

The procedure followed made use of the findings of Papanicolaou, Traut and Marchetti[1] and of the New York Postgraduate Hospital modification of Panicolaou's technic.

REVIEW OF THE LITERATURE

For many years Papanicolaou has studied epithelial smears in human beings and laboratory animals. He first reported the use of exfoliative cytology with Stockard[2] in a study of the estrous cycle in the guinea pig.

Through progressive improvement this technic has been able to show a varying degree of keratinization in the cells of the vaginal epithelium in different stages of the menstrual cycle[3] and also to demonstrate the presence of cancer cells in vaginal smears.[4] Such a technic is now widely used in the diagnosis of uterine cancer.[5]

In the past only biopsy and necropsy materials were used in studying the keratinization of the mouth. Weinmann[6] was the first to use an exfoliative process for that purpose. Staining the smears with the Wright and Ernst-Gram methods, he reported a series of six stages in the process of keratinization and its varying degree in different sites of the mouth, the lowest being in the cheek and increasing progressively in the tongue, gingiva and hard palate.

Using the Shorr modification of the Papanicolaou stain, Ziskin and Moulton[7] observed parallel changes occurring in the oral and vaginal epithelia during the menstrual cycle. The same correlation was observed in smears of the cheek and ventral surface of the tongue by Iusem.[8] Taking gingival smears of 215 women and relating the date to the menstrual cycle in each patient, Papic and Glickman[9] concluded that such a correlation does not exist.

Recently Montgomery[10] using the Papanicolaou method investigated the normal cytologic picture of the oral mucosa in 80 normal individuals of varying age and sex, finding definite patterns for different regions of the mouth. He concluded that "age, sex or the menstrual cycle does not significantly influence the cellular pattern of the oral mucosa as investigated by such method." In a recent article, the same author[11] reports the use of the same method in the study of oral leukoplakia.

At the Department of Periodontia of New York University College of Dentistry, an extensive research project is being conducted to determine whether a pattern of keratinization exists in the oral mucosa of normal human subjects, using the smear technic and Papanicolaou stain. In a group of fifty men, ranging in age from 20 to 30 years, Miller, Soberman and Stahl[12] found the highest degree of keratinization at the gingivae, followed by the dorsum of the tongue, the cheek and the ventral surface of the tongue. The same cellular pattern was confirmed in other age groups in studies performed by postgraduate groups. In a homogeneous group of aged males Stone[13] found a marked tendency toward a decrease in keratinization.

MATERIAL AND METHODS

Fifty male patients, ranging in age from 60 to 80 years, were taken at random at the Periodontia Clinic for this investigation. A wooden spatula was used to take scrapings from the following sites:

* Presented as partial fulfillment of postgraduate requirements in the Department of Periodontia, New York University College of Dentistry.

a) The midline of the anterior third of the dorsal aspect of the tongue.
b) The midline of the anterior third of the ventral aspect of the tongue.
c) The area of the cheek just anterior the opening of Stenson's duct.
d) The labial margin of the lower anterior gingiva.

Each scraping was transferred to a glass slide and immediately immersed for fixation in equal parts of 95% ethyl alcohol and ether.

The following laboratory procedure was then used:

1) Run slides through 80%, 70%, 50% alcohol to water. Change slides when they do not appear oily.
2) Stain in Foot-Harris hematoxilin for 6 minutes (3 minutes if hematoxilin is fresh). Filter hematoxilin each day.
3) Rinse in distilled water until the water is clear.
4) Dip in 0.5% HC1 5-10 times until slides turn blue again.
5) Place in tap water for one minute until slides turn definitely blue.
6) Rinse in distilled water 5-10 minutes.
7) Run slides in 70%, 80% and 95% alcohol as before.
8) Stain in OG 6 for one minute (slides turn black-brown).
9) Rinse in 95% alcohol (3 changes).
10) Stain in E.A 50 for 2 minutes. (Slide will have blue and red parts.)
11) Rinse in 95% alcohol (3 changes), alcohol-xylol in equal parts, three changes in pure xylol.
12) Mount.

FINDINGS

The cells were classified into the three following groups:

1) Blue staining cells with nuclei (basophilic cells).
2) Red staining cells with nuclei (acidophilic cells.
3) Yellow-staining cells either with small, pyknotic nuclei or anuclear.

The blue-staining and red-staining cells were found to be predominant in the cheek and in the ventral and dorsal surfaces of the tongue. The yellow cells were present in a very small percentage in the cheek and ventral surface of the tongue and on a somewhat larger scale in the dorsum of the tongue; they were, however predominant in the lower anterior gingiva.

The blue-staining cells have a large nucleus and their cytoplasm takes a pale, medium or dark blue shade when treated by the basophil stain.

The red-staining cells, irregular in shape, show small, dense, somewhat pyknotic nuclei and a granular cytoplasm.

The yellow-staining cells are very irregular in outline and show all different phases of nuclear disintegration. The following statistical data were obtained:

a) Dorsum of the tongue:

Blue-staining cells	31.86
Red-staining cells	50.28
Yellow-staining cells	17.86

b) Ventral surface of the tongue:

Blue-staining cells	68.70
Red-staining cells	28.36
Yellow-staining cells	2.94

c) Cheek:

Blue-staining cells	65.70
Red-staining cells	30.40
Yellow-staining cells	3.90

d) Gingiva:

Blue-staining cells	25.80
Red-staining cells	31.10
Yellow-staining cells	43.10

DISCUSSION

The present and other referred studies suggest that a definite cytologic pattern exists for different sites of the human oral mucosa. Such pattern is in agreement with previous histologic findings.[14]

The highest degree of keratinization is found in the gingiva; it progressively decreases in the dorsum of the tongue, the cheek and the ventral surface of the tongue.

In old age there is a marked tendency towards a decrease in the keratinization of the oral mucosa. This fact may be regarded as one of the tissue changes

pertinent to the physiologic, involutional process that occurs with aging.

In spite of the reduction of keratinized cells, the aforementioned cytologic pattern established for different regions of the mouth in various age groups is constant here.

A comparison of the figures obtained in this study and in a previous one done by Stone[13] in the same age group shows a great similarity for all areas from which scrapings were taken, excepting the lower anterior gingiva, which in the present investigation shows an appreciable increase in keratinization.

Such a difference may be due to the fact that, in our investigation, patients under periodontal treatment and toothbrush stimulation were used, while in Stone's study such a condition did not exist.

SUMMARY AND CONCLUSIONS

1) Fifty males, ranging in age from 60 to 80 years, taken at random at the Periodontia Clinic of N.Y.U. College of Dentistry, were used for this investigation.

2) Four sites of the oral mucosa were selected for a study of the keratinization using the direct smear technic of Papanicolaou.

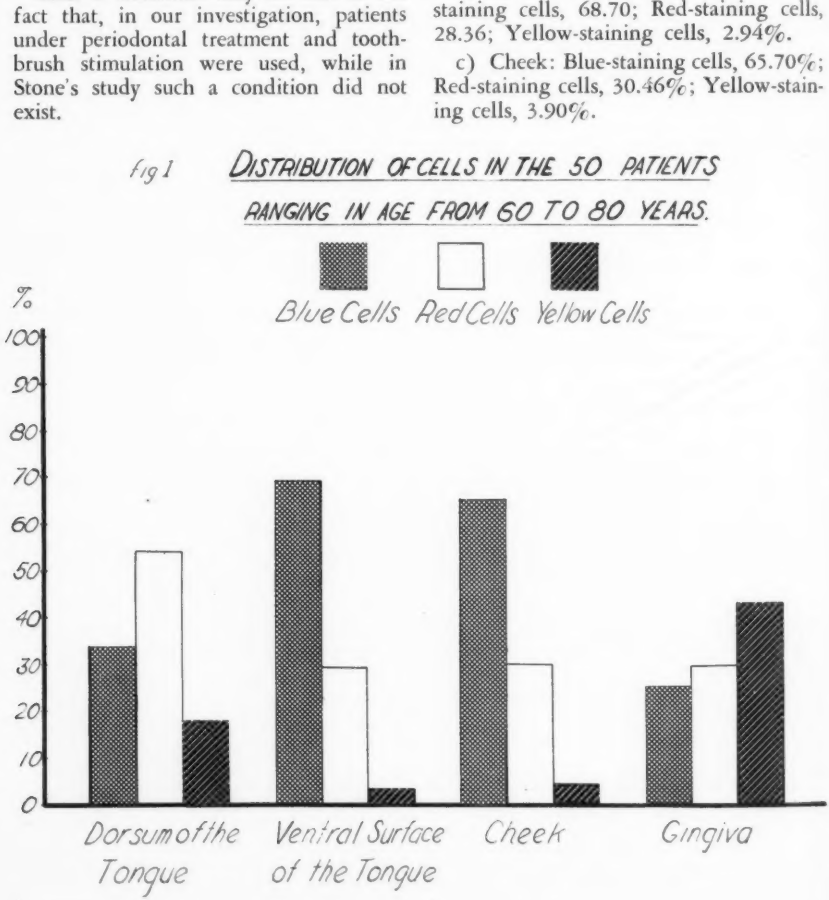
3) The findings were as follows:

a) Dorsum of the tongue: Blue-staining cells, 31.86%; Red-staining cells, 50.28%; Yellow-staining cells, 17.86%.

b) Ventral aspect of the tongue: Blue-staining cells, 68.70; Red-staining cells, 28.36; Yellow-staining cells, 2.94%.

c) Cheek: Blue-staining cells, 65.70%; Red-staining cells, 30.46%; Yellow-staining cells, 3.90%.

fig 1 DISTRIBUTION OF CELLS IN THE 50 PATIENTS RANGING IN AGE FROM 60 TO 80 YEARS.



d) Gingiva: Blue-staining cells, 25.80% Red-staining cells, 31.10%; Yellow-staining cells, 43.10%.

4) The results indicate that the highest degree of keratinization is found in the gingiva. It progressively decreases in the dorsum of the tongue, the cheek and the ventral aspect of the tongue.

5) A marked tendency towards a decrease in keratinization seems to occur in old age.

6) The keratinization of the gingivae was found to be higher in this group of patients than in the other one, within the same age range, studied by Stone. An explanation for such a divergence is suggested, based on the fact that the patients used in the present investigation were under active periodontal treatment and toothbrush stimulation.

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Many a man thinks he has a clear conscience when he has only a poor memory.

PRACTICAL ASPECTS OF ANTIBIOTIC THERAPY IN RELATION TO DENTISTRY AND ORAL SURGERY*

JOHN A. KOLMER, M.D., *Philadelphia, Pa.*†

MICROORGANISMS IN RELATION TO ANTIBIOTIC THERAPY

Gram-positive cocci with special reference to alpha streptococci (*Str. viridans*), staphylococci and pneumococci.

Gram-positive bacilli with special reference to oral lactobacilli and *Myco. tuberculosis.*

Gram-negative cocci (Neisseriae) are of minor or doubtful significance.

Gram-negative bacilli with special reference to *B. fusiformis; K. pneumoniae* (*B. friedländers*), *Esch. coli* and Hemophilus of less importance.

Spirochetes with special reference to *B. vincentii and T. pallidum.*

Fungi with special reference to *A. bovis* and *C. albicans.*

Viruses of herpes simplex and herpes zoster.

ANTIMICROBIAL ACTIVITY OF ANTIBIOTIC COMPOUNDS

Penicillin: highly effective against gram-positive cocci and bacilli (including oral lactobacilli), gram-negative cocci, *B. fusiformis* and *A. bovis;* ineffective against *C. albicans* and viruses.

Dihydrostreptomycin: highly effective against gram-negative bacilli, *Myco. tuburculosis* and some strains of gram-positive cocci.

Bacitracin: similar to penicillin including oral lactobacilli; effective against penicillin resistant bacteria.

Aureomycin: similar to penicillin including oral lactobacilli; effective against penicillin resistant microorganisms and probably against herpetic viruses.

Chloromycetin: especially effective against gram-negative bacilli and herpetic viruses.

Terramycin: similar to penicillin and aureomycin but more effective against gram-negative than gram-positive bacteria.

PRINCIPLES IN THE CHOICE OF ANTIBIOTIC COMPOUNDS

With all of these compounds now available, accurate clinical and/or bacteriological diagnosis is more important than ever.

Therapeutic effectiveness is the criterion of most importance. But the relative toxicity of compounds along with their cost and ease of administration also require careful consideration.

Sensitivity tests are frequently required for the detection of natural or acquired resistance of bacteria isolated from patients and especially when unsatisfactory therapeutic results are being observed. The method employing discs or tablets impregnated with various compounds is simple, satisfactory and inexpensive. With this method sensitivity to penicillin, streptomycin, bacitracin, aureomycin, chloromycetin and terramycin may be determined simultaneously (Fig. 1).

NATURAL AND ACQUIRED RESISTANCE OF ORGANISMS

Naturally resistant variants among susceptible species of bacteria are frequently responsible for treatment failures. They are detected by sensitivity tests. When present, give larger doses or change to another compound.

Bacteria do not usually or readily acquire resistance to penicillin *in vivo.* Resistance to dihydrostreptomycin is readily and frequently acquired.

Bacteria may acquire resistance to bacitracin, aureomycin, chloromycetin and terramycin, but the incidence is apparently quite low.

† Professor of Medicine, School of Medicine and School of Dentistry and Director of the Institute of Public Health and Preventive Medicine, Temple University.

* From the Institute of Public Health and Preventive Medicine of Temple University, 2101 Pine Street, Philadelphia 3, Pennsylvania. Presented by invitation at the fifth annual convention of the American Academy of Dental Medicine, June 23, 1951.

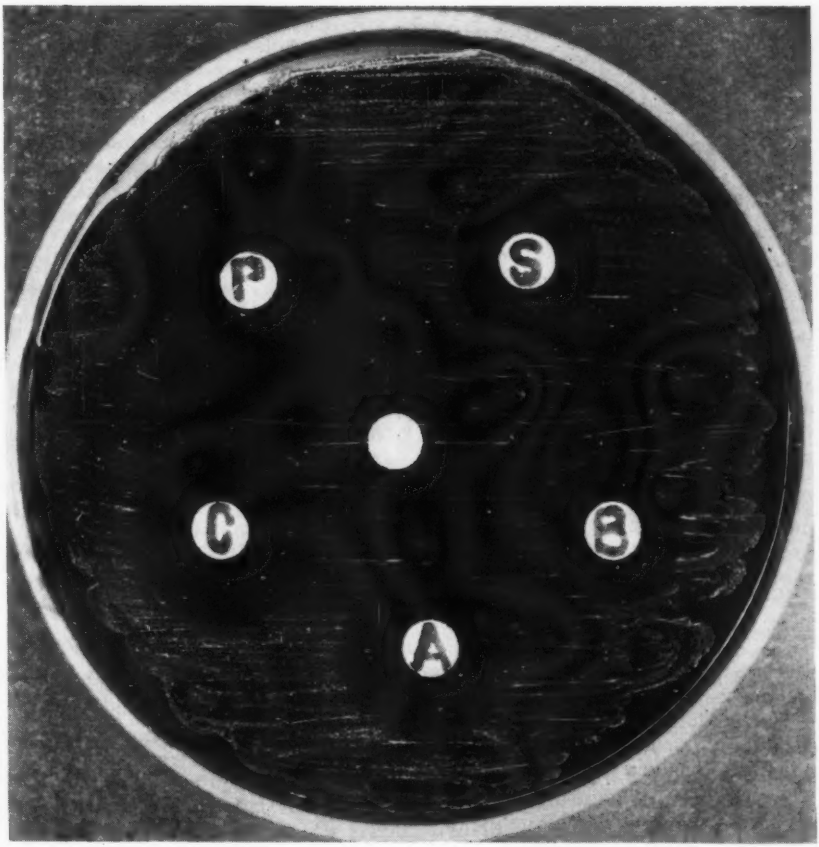

Fig. 1. Paper Disc Sensitivity Test Employing Staphylococcus Aureau. P = penicillin; S = streptomycin; B = bacitracin; A = aureomycin; C = chloromycetin; center disc is a control.

Whether or not viruses acquire resistance *in vivo* cannot be stated at the present time.

TOXICITY AND ALLERGIC SENSITIZATION

Penicillin by local or topical applications of solutions, troches, ointment, cones and paper points are well borne as, likewise, by local injections in the gingivae and by oral and intramuscular injection.

Natural or acquired allergic sensitization to penicillin, however, is of common occurrence. Topical applications are especially likely to result in acquired sensitization; consequently the indiscriminate and unnecessary use of this compound should be avoided.

For unknown reasons the topical, oral and parenteral administration of penicillin sometimes produces infections with *C. albicans* resulting in oral moniliasis.

Natural and acquired allergic sensitization to bacitracin and aureomycin by

topical and oral administration is rare. Bacitracin may be renotoxic upon oral or parenteral administration. Aureomycin may produce mild temporary irritation upon topical application and also gastrointestinal disturbances upon ingestion.

Chloromycetin and terramycin by ingestion are well borne; troches, pastes and cones for topical use are not commercially available.

PRINCIPLES IN THE USE OF ANTIBIOTIC COMPOUNDS

Avoid their indiscriminate and unnecessary use as much as possible.

If severe infections institute treatment as promptly as possible on the basis of clinical diagnosis. Change treatment if/or when necessary according to the results of bacteriologic examinations.

In acute infections give large initial or priming doses. In these cases large doses over a short period of time are preferred to small doses over a long period. The antibiotic must be present at the site of infection in sufficient concentration to exert maximum therapeutic effects.

Do not stop treatment too soon in order to prevent relapsing infections as much as possible.

Do not forget that adequate surgical or other adjuvant measures may be and usually are required.

COMBINATION CHEMOTHERAPY (Synergistic or Additive)

This consists of the simultaneous administration of two compounds. In some instances the effects appear to be truly synergistic while, in others, they are merely additive.

Frequently indicated in the treatment of severe infections like Ludwig's angina and actinomycosis with penicillin and sulfadiazine, tuberculosis with dihydrostreptomycin and para-aminosalicylic acid, etc.; likewise in the treatment of mixed infections like chronic osteomyelitis with penicillin and dihydrostreptomycin and those due to resistant organisms.

Tends to reduce the incidence of acquired resistance of bacteria.

Usually no contraindications from the standpoint of toxic reactions.

ADMINISTRATION OF PENICILLIN

Intramuscular (procaine penicillin G): 300,000 units in aqueous suspension every 12 hours; or 300,000 or 600,000 units in peanut oil once a day; or 600,000 units in peanut oil with aluminum monostearate every 2 or 3 days; or a mixture of 100,000 units soluble penicillin G with 300,000 units procaine penicillin once a day for prompt effects.

Oral: tablets of 100,000 or 250,000 units given ½ hour before or 1½ hours after meals and at bedtime.

Topical: non chewing troches (5000 units) every hour for several doses followed by chewing troches (20,000 units) every 3 or 4 hours during the day; adhesive ointment (1000 or 10,000 units per gm.) once a day; cones (1000 units) once a day; paper points (3000 units) once a day; for intragingival injection: a solution prepared of 100,000 units, 0.2 gm. procaine hydrochloride, 0.5 ml. adrenalin (1:1000) and sterile water to make 10ml.; 800,000 units per ml. sterile peanut oil for root canal therapy.

Combined: in severe gingivitis troches with oral or intramuscular administration.

ADMINISTRATION OF BACITRACIN

Intramuscular: for treatment of severe infections only (10,000 units every 6 hours); for intragingival injection: 500 units per ml. of sterile water.

Oral: 20,000 units ½ hour before or 1½ hours after meals and at bedtime.

Topical: troches (1000 units) every 3 or 4 hours during the day; ointment (500 units per gm.) once a day.

ADMINISTRATION OF AUREOMYCIN

Oral: capsules of 50, 100 or 250 mg. every 6 hours during the day; 250 or 500 mg. every 4 hours in severe infections.

Topical: troches (15 mg.) every 3 or 4 hours during the day; dental paste (30 mg. per gm.) once a day; cones (5 mg) once a day; 8 per cent suspension in sterile saline solution or peanut oil once a day in root canal therapy.

ADMINISTRATION OF DIHYDROSTREPTOMYCIN, TERRAMYCIN AND CHLOROMYCETIN

Dihydrostreptomycin: 0.5 gm. in sterile water by intramuscular injection every 12 hours; Pfizer's combiotic (300,000 units procaine penicillin, 100,000 units sodium penicillin and 1.0 gm. dihydrostreptomycin in 2.2 ml. sterile water) by intramuscular injection once or twice a day and in root canal therapy once a day for synergistic effects and in the treatment of mixed infections.

Terramycin: Capsules (50, 100 or 250 mg.) by ingestion every 6 hours (1 to 2 gm. per day); troches (15 mg.) 8 to 16 during the day; dental paste and cones will probably become available.

Chloromycetin: Capsules (50 mg.) or kapseals (250 mg.) by ingestion every 4 to 6 hours.

ANTIBIOTIC COMPOUNDS OF CHOICE IN RELATION TO DENTISTRY AND ORAL SURGERY

A = aureomycin; B = bacitracin;
C = chloromycetin; P = penicillin;
S = dihydrostreptomycin;
T = terramycin.

Actinomycosis: P
Abscesses: P-A-T
Anthrax: P
Agranulocytosis: P
Aplastic anemias (oral lesions): P-A
Gingivo-stomatitis:
  bacterial: P-A
  fusospirochetal: P-S-A
  gangrenous: P
  herpetic: C
Granuloma inguinale: S-A-C-T
Herpes zoster: C-A
Leukemia (oral lesions): P-A
Ludwig's angina: P
Lymphogran. venereum: C
Osteomyelitis: P-S-A
Pericoronitis: P-A
Periodontitis: P-A-S
Pulpitis: P-S-A
Syphilis: P
Tuberculosis: S

CAUSES OF TREATMENT FAILURES

Mistaken clinical and/or laboratory diagnosis.

Infections due to organisms possessing high natural or acquired resistance.

Dosage too small, intervals of administration too long, or duration of treatment too brief.

Overwhelmingly severe infections or too long delay in treatment.

Inadequate surgical measures or failure to use other adjuvant measures of helpful value.

Localization of infections in areas inaccessible to compounds administered.

Occurrence of spontaneous new infections or superinfections indicating the frequent need for repeated bacteriological examinations during treatment and convalescence (especially in the event of relapses).

PROPHYLAXIS OF INFECTIONS IN RELATION TO DENTISTRY AND ORAL SURGERY

Before plastic operations involving the mouth.*

Before surgical procedures associated with extensive trauma.*

Before extractions of impacted third molars.*

Before extractions in the presence of acute gingivitis.*

Following accidental opening of the maxillary sinus.*

Following accidental injuries of the cheeks, tongue, lips or floor of mouth.*

In compound fractures of the jaws.*

In fractures of the mandible involving impacted third molars.*

In severe diabetes mellitus requiring extractions.*

To prevent exacerbations of neuritis, iritis, etc., due to dental infections following extractions.*

To prevent subacute bacterial endocarditis in cases of congenital and valvular heart disease; 600,000 units of procaine penicillin the day before, the day of and the day after extractions; or 250 mg. aureomycin every 4 hours for 8 doses.

* One to three or more doses of procaine penicillin (300,000 units) at daily intervals or 250 mg. aureomycin every 6 hours for several days.

AMERICAN ACADEMY OF DENTAL MEDICINE ANNUAL AWARD 1951

Upon recommendation by their respective medical and dental colleges the following senior students have been nominated for the Award for Proficiency in Dental Medicine given annually by the American Academy of Dental Medicine. This award consists of a duly inscribed certificate and a five year subscription to the Journal of Dental Medicine.

DENTAL SCHOOLS

Nominee	*Recommending Officer and School*
THOMAS R. ALLEY 4105 Walnut Street, Philadelphia 4, Pennsylvania.	J. L. Appleton, Dean, University of Pennsylvania Dental School.
WILLIAM M. ALLISON Box 328, Columbia Falls, Montana.	James H. Pence, Dean, Creighton University School of Dentistry.
MAJOR McKINLEY ASH 313 Thompson Hall, Box 183, Emory University, Georgia.	John E. Buhler, Dean, Emory University School of Dentistry.
ROBERT C. BLACKBURN c/o Ohio State University College of Dentistry, Columbus 10, Ohio.	H. B. G. Robinson, Director of Clinical Training, Ohio State University, College of Dentistry.
HARRY BLECHMAN 242 E. 71st Street, New York 21, New York.	Walter H. Wright, Dean, New York University College of Dentistry.
LIONEL D. CARON 16503 Ward, Detroit 35, Michigan.	Rene Rochon, Dean, University of Detroit, School of Dentistry.
THEODORE ALVIN CHUMAN 3428 "J" Street, Lincoln 8, Nebraska.	B. L. Hooper, Dean, University of Nebraska, College of Dentistry.
HAROLD L. CLEATH 3334 - 41st Ave. S., Minneapolis, Minnesota.	W. H. Crawford, Dean, University of Minnesota, School of Dentistry.
DAVIS ELAM E-7 Green Tree Manor, Louisville, Kentucky.	Raymond Myers, Dean, University of Louisville, School of Dentistry.
MALCOLM D. GILLIGAN 410 Raymond Street, Chevy Chase, Maryland.	C. V. Rault, Dean, Georgetown University, School of Dentistry.
SAMUEL SALMAN GRILICHES 915 Shepherd Street, N.W., Washington 11, D. C.	Russell A. Dixon, Dean, Howard University, College of Dentistry.
FRANK LEO IRELAND 6147 S. Shipple Street, Chicago, Illinois.	Allan G. Brodie, Dean, University of Illinois, College of Dentistry.
WILLIAM C. JACKSON 3556 Caroline Street, St. Louis 4, Missouri.	Lee Roy Main, Dean, St. Louis University, School of Dentistry.

All of the recognized medical and dental schools of the United States and Canada (122 in number) were asked to select a senior student who has shown the highest degree of interest and proficiency in the field of dental medicine.

With the linguistic help of Dr. Leonard Rosenthal, the dental school in Guatemala and the dental and medical schools in Lima, Peru were invited to select candidates for the award.

The results of the committee are as follows:

Of the 80 medical schools, 57 or 71% made selections. Thirteen or 16.2% failed to select candidates and 10 or 12.4% failed to answer repeated communication.

Of the 45 dental schools, 39 or 86.6% made selections. Three or 6.6% failed to make selections and 3 or 6.6% did not answer repeated communication.

Of the 125 medical and dental schools, 96 or 77% made selections.

The Committee wishes to thank Dr. Gordon Winter for all his efforts in aiding the functions of the Committee.

GEORGE G. STEWART, *Chairman*

Nominee	*Recommending Officer and School*
RAYMOND LUCIEN JOSEPH LEBEL Apt. G-4, Stearns Village, Medford, Massachusetts.	C. D. Marshall-Day, Dean, Tufts College Dental School.
ALVIN L. MORRIS 1025 Vaughn Street, Ann Arbor, Michigan.	P. H. Jeserich, Dean, University of Michigan, School of Dentistry.
SAMUEL M. NARSETE 3828 West End Avenue, Chicago 24, Illinois.	A. Baralt, Jr., Dean, Loyola University, School of Dentistry.
MONICA NOVITSKI 746 No. 24th Street, Milwaukee, Wisconsin.	O. M. Dresen, Dean, Marquette University, School of Dentistry.
DONALD E. PRIEWE 1391 - 8th Street, Apt. 8, San Francisco, California.	W. C. Fleming, Dean, University of California, College of Dentistry.
CARMEN RIVIELLO 510 Broadway, Camden, New Jersey.	G. D. Timmons, Dean, Temple University, School of Dentistry.
JOHN JOSEPH ROBINSON c/o Baltimore College of Dental Surgery, Baltimore, Maryland.	J. Ben Robinson, Dean, Baltimore College of Dental Surgery, University of Maryland.
FRANK D. SANDERS, JR. 8110 Spruce Street, New Orleans 18, Louisiana.	Frank J. Houghton, Dean, Loyola University, School of Dentistry.
ROBERT L. SCHNEE c/o Northwestern University Dental School, Chicago, Illinois.	Chas. W. Freeman, Dean, Northwestern University Dental School.
WARREN M. SHADDOCK 1 Westland Avenue, Rochester, New York.	Leon Gauchat, Dean, University of Buffalo Dental School.
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MORSTON G. SLATE, JR. 1316 Bernard, Pasadena, Texas.	F. C. Elliott, Dean, Vice-President, University of Texas Dental School.
JULES WALKER SMYTHE 300 Taylor Street, Bristol, Tennessee.	James T. Ginn, Dean, University of Tennessee, College of Dentistry.
MARLON DAVIS STEINERT 116 East 9th Street, Kansas City, Missouri.	Roy James Rinehart, Dean, University of Kansas City, School of Dentistry.
CARL C. STEINMAN 102 Lafayette Street, Delphi, Indiana.	Maynard K. Hine, Dean, Indiana University, School of Dentistry.
CLARE LAVERNE TEETER Dental School, State University of Iowa, Iowa City, Iowa.	A. W. Bryan, Dean, College of Dentistry, State University of Iowa.
MICHAEL TIMKO 401 Third Street, Taylor, Pennsylvania.	L. E. Van Kirk, Dean, University of Pittsburgh, School of Dentistry.
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LEONARDO V. YUNGA San Jose 307, Lima.	Luis F. Rojas S., Dean, Greater National University of San Marcos of Lima-Dental Dept.

DENTAL SCHOOL IN GUATEMALA

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MEDICAL SCHOOL IN PERU

J. J. M. BARRERA Carabaya 1033, Lima.	Ricardo T. Varelo, Dean, Greater National University of San Marcos of Lima.

ABSTRACTS

Oral Cancer*

The decrease in deaths from mouth cancer during the last 10 years can be attributed in part to early detection of the disease by the dentist, a cancer specialist reported recently in The Journal of the American Dental Association.

Dr. Leonard B. Goldman, director of the cancer prevention and detection center at Queens General Hospital, Jamaica, N. Y., said that "since most persons visit their dentists periodically, early cancer often may be found during a routine dental examination."

Dr. Goldman, who is also professor of radiotherapy at the New York Medical College, Flower and Fifth Avenue Hospitals, New York City, urged an extension of dental health education.

"To the well-known advice, 'See your dentist twice a year,' should be added the slogan: 'Your dentist can help you prevent mouth cancer,' " he said.

Dr. Goldman listed as factors in mouth cancer infected gums, jagged teeth, ill-fitting dentures and excessive smoking.

"How much these factors contribute to cancer is unknown," he said. "However, it is known that the incidence of cancer is much lower in the well-kept mouth than in the neglected one."

Urging that every dental examination include a check-up for suspect growths, Dr. Goldman said:

"Treatment of malignant tumors of the mouth needs the combined skill of the dentist and the physician. The dentist is the detective and the physician the prosecutor . . . "

Citing the appreciable decline in mouth cancer deaths, the physician said that in 1936 there were 4,081 deaths from mouth cancer, a mortality rate of 3.19 per 100,000, as compared with 1947 when there were 3,755 deaths a mortality rate of 2.6 per 100,000.

In an editorial, the A.D.A. Journal described early detection and insistence upon immediate surgical attention as "the great service dentistry can render to the public in the war against cancer."

Pointing out that a cancerous lesion may exist for some time without the person being aware of it, the editorial concurred with Dr. Goldman in recommending that dental treatment include examination for cancer.

"In the early detection of these new growths, the dentist may save the life of his patient and render him a service that no one else is able to perform," the editorial said.

* A.D.A. Press Release, April 1, 1951.

Effect of Ammoniated Dentifrices*

The possibility that a slight reduction in tooth decay can be obtained by persons using ammoniated dentifrices was reported recently in The Journal of the American Dental Association.

The report was based on a two-year research study made under the direction of Dr. Robert E. Kesel, of the University of Illinois College of Dentistry at Chicago, among schoolchildren in Peoria, Ill. The study is the most extensive ever conducted in the field of ammoniated dentifrices.

Dr. Kesel, who is head of the applied materia medica and therapeutics department at Illinois, found "a trend which indicates the usefulness both of good oral hygiene and of ammoniated dentifrices."

The dental scientist emphasized, however, that further investigation would be desirable to determine whether the trend becomes more significant.

Final results of the study indicated that children who brushed their teeth with an ammoniated tooth powder under supervision had 10.18 per cent of their teeth attacked by decay as compared with 11.62 per cent for boys and girls who used a non-ammoniated dentifrice under supervision and 12.80 per cent for children who were not instructed in proper tooth-brushing procedures.

This was a reduction of about 20 per cent in the rate of decay for children who brushed their teeth under supervision with an ammoniated dentifrice as compared with the boys and girls instructed to follow their usual mouth hygiene habits, Dr. Kesel pointed out.

The A.D.A. Journal editorially viewed with apprehension the possibility that the new report would "precipitate a new dentifrice advertising deluge." In a sharp attack on advertising technics used in the promotion of dental products, the editorial said:

* A.D.A. Press Release, Feb. 4, 1951.

"It is unfortunate that so many scientific reports presented by the most careful and conscientious research workers are distorted by hucksters at times for purely commercial purposes."

The Journal said that distortion may consist of overemphasizing minor factors in a research study, trick phraseology or "discreet omissions" from a report in order to bolster sales.

The Peoria study began with 1,716 children, 10 and 11 years old when the experiment was started. The total later dropped considerably, however, when there was a mass shifting of children to other schools. A final x-ray survey was made of 592 children, divided into three groups.

A control group of 251 children had been instructed to follow their usual mouth hygiene habits and were given no instruction in proper care of the teeth.

Another group of 171 boys and girls were instructed in proper brushing of the teeth and spent two minutes twice a day in the classroom brushing the teeth with a non-ammoniated dentifrice.

The third group of 170 children followed the same procedure as the second but used the ammoniated dentifrice.

Ammoniated dentifrices are tooth pastes and powders containing urea and usually dibasic ammonium phosphate. They were developed in 1946 after it was observed that ammonia formed at a more rapid rate in the saliva of individuals whose teeth did not decay than in the mouths of individuals susceptible to decay.

Patient Psychology With Full Dentures

Some persons who require extraction of all their teeth should be psychologically conditioned to toothlessness, Dr. Muller M. DeVan, of Philadelphia, said recently in The Journal of the American Dental Association. He recommended that partial dentures be used temporarily for these individuals.

Dr. DeVan, chairman of the prosthetic department of the School of Dentistry, University of Pennsylvania, said it may be to a patient's advantage to have only a few teeth removed at one time.

"Many patients must be made ready for the loss of all their teeth," he said. "We must inject the element of time in destroying the mechanism—the same element nature employs in building the masticatory machine."

In advising that it is sometimes wise to put in partial dentures temporarily, Dr. DeVan said:

"Partial dentures that subsequently may be converted to complete dentures provide for the patients probational periods that are both thoughtful and humane. They ease the physical and psychological ordeal involved in the transition from natural to artificial teeth."

Dr. DeVan said removal of all the teeth should also be determined by the tone of the mucous membranes.

"Patients with high muscle tone, physiologic or due to tensions, should have probational periods with partial dentures," he said. "This interval should be utilized by the patient in consciously relaxing the lower jaw. Some persons are surprised to learn that their teeth ought not to be in contact except while chewing or swallowing."

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* A.D.A. Press Release, March 1, 1951.

Fluoridation of Community Water Supplies*

The Journal of the American Dental Association recently denounced opponents of flouridation of community water supplies as more interested in voicing unsubstantiated opinions than in improving the dental health of children.

It placed those who oppose the public health measure in the same category as those who have sought in the past to block progressive health advances.

"How anyone . . . can disregard the potential value of fluoridating communal drinking water is beyond comprehension," a Journal editorial declared.

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* A.D.A. Press Release, May 1, 1951.

Flouridation, the process of adding small amounts of flourides to public water supplies, was endorsed by the American Dental Association, the U. S. Public Health Service, the American Water Works Association and other authoritative groups after extensive research established the procedure as an effective, large-scale method for reducing tooth decay among children. More than 70 cities and towns throughout the United States are fluoridating their water. The editorial added:

"Already communities that have artificially fluoridated their drinking water . . . report a 30 to 40 per cent average reduction of dental caries (decay) among their children. Objectors to the process are invited to produce scientific evidence to discount that fact.

"Inane as the arguments are, they help to retard progress. They are reminiscent of the arguments advanced 75 to 100 years ago against the use of amalgam fillings because of the poisonous properties of mercury.

"They are remindful of the heated objections to the extension for prevention theory when it was first enunciated by G. V. Black (noted dental scientist who devised a new technic for dental fillings). Time and experience have proved the worth of amalgam fillings and Black's principles of cavity preparation. Time and experience will prove the worth of water fluoridation."

Role of Smoking in Necrotizing Ulcerative Gingivitis*

The theory that smoking is a factor in periodontal disease was advanced by a Danish dental scientist in The Journal of the American Dental Association.

Dr. J. J. Pindborg, of Copenhagen, who conducted examinations of 9,577 men in the Danish armed forces, reported that necrotizing ulcerative gingivitis, (Vincent's infection), characterized by painful ulcerated bleeding gums, was found principally among smokers. The prevalence of the disease among soldiers during World War I gave it the name of trench mouth.

Findings indicated that the disease attacks smokers seven times as frequently as it does nonsmokers, Dr. Pindborg said. He is an official of the National Dental College of Denmark, the Danish National Health Service and the medical corps of the Royal Danish Navy.

He reported that necrotizing ulcerative gingivitis was found among 6.9 per cent of the 6,960 sailors when they entered the navy and the frequency rose to 19.6 per cent after some months of service. For new soldiers, the incidence was 5.5 per cent, rising to twice that percentage after preliminary training.

"The explanation is, in all probability, that sailors and soldiers are under more efficient supervision as regards both general and personal hygiene while undergoing the preliminary training," Dr. Pindborg said.

"When transferred to the military service proper, on board ships, in coast defense installations, in camps, and so forth, personal hygiene gradually decreases, and the effect is reflected in an increased incidence of ulceromembranous gingivitis (Vincent's infection)."

* A.D.A. Press Release, May 1, 1951.

Steel that loses its temper is worthless.
It's the same with man.

BOOK REVIEWS

Exodontia (Fourth Edition). By M. Hillel Feldman, D.D.S., F.I.C.A. Philadelphia, Pa. Lea & Febiger, 1951. 290 pp., 322 illustrations, $6.50.

This fourth edition of a famous book first published in 1926 offers the knowledge of one of the best known specialists in the field of oral surgery.

As in previous editions, Dr. Feldman emphasizes the superiority of drill procedures over chisel and mallet in exodontic operations. To this new addition has been added a chapter on Dental Malpractice Jurisprudence by Michael A. Hayes of the New York Bar, and replacement of many of the old illustrations by excellent and revealing new ones. Many of these illustrations are remarkable in the clarity with which they show the author's technic of tooth extraction.

With this book the general practitioner who feels that his services in the practice of exodontia is limited will find his scope greatly enlarged with a minimum of risk.

A.N.A.

Stress, A Treatise Based on the Concepts of the General Adaptation Syndrome and the Diseases of Adaptation. By Hans Selye, M.D., Montreal, Canada. Acta, Inc., 1950. 822 p., illustrated. $17.50.

The author applies concepts of the general adaptation syndrome to integrate a number of seemingly unrelated phenomena into a single unified biologic system. The keynote of this is the tenet that all living organisms can respond to stress as such. And, that in this respect the basic reaction pattern is always the same irrespective of the agent used to produce stress. The author calls this response the general adaptation syndrome and, its derailments, the diseases of adaptation. Anything that causes stress endangers life unless it is met with adequate adaptation responses. The author surveys every field of science in search of the stress factor. With the advent of ACTH and cortisone this concept has been given greater impetus in seemingly unrelated systemic disorders. The author presents in this voluminous text the physiological and pathological aspects of systemic stress, metabolic mechanisms on all the bodily systems in relation to health and disease, always reviewed in terms of this syndrome. The book is an eye-opener to the physician interested in interpretation of everyday clinical phenomena.

I. Newton Kugelmass

Textbook of Endocrinology. By Hans Selye, M.D., Montreal, Canada. Acta Endocrinologica Inc., 1947. 914 p., illustrated, $17.50.

Endocrinology comprises anatomic, physiologic, biochemical, genetic, pathologic, clinical zootechnical data. It is a biologic science through the study of the function of endocrine glands and the role of hormones in the body. As a branch of medicine it endeavors to safeguard health by preventing disease. This new edition reveals all aspects of endocrinology presented critically and concisely. The author only crystallizes the recent advances by integrating all aspects of the subject into a workable science. It is not only a text but an atlas presenting history, crystallization of hormones, experimental set-ups, clinical cases and radiograms. The subject material is divided in the usual manner as an introduction of general endocrinology. Each of the endocrine systems is evaluated individually and correlated clinically. The work is a monumental contribution to medicine and should be the basis of a reference for any unusual problem.

I. Newton Kugelmass

Psychosomatic and Suggestion Therapy in Dentistry. By Jacob Stolzenberg, D.D.S. New York, N. Y. Philosophical Library, 1950. 152 p. $3.75.

In view of the increasing interest in psychosomatics and hypnosis in dentistry Dr. Stolzenberg's book offers much information for those interested in these fields.

In a recent article by W. T. Heron in the Iowa Dental Bulletin (36:142-143, Aug., 1950) the statement was made that the psychologic aspects of dentistry have not yet received the attention they deserve. He also said that the most powerful tool the dentist has for the control of behavior is suggestion.

Dr. Stolzenberg has in this book summed up his experiences of twenty-five years of investigations in the application of psychosomatic principles to dentistry. The last chapter of the book deals with the technic of hypondontics and suggestion therapy as applied to dental practice.

Dr. Hamilton B. G. Robinson has written in the 1950 Year Book of Dentistry that proponents of the use of hypnosis in dentistry seem highly enthusiastic, those who observe its use are often amazed and the rest of the profession is generally disinterested.

It behooves those who would follow this subject beyond the present pioneering stage to familiarize themselves with this book, one of the best on the subject yet to appear.

A.N.A.

Understandable Psychiatry. By Leland E. Hinsie, M.D., New York, N. Y. The Macmillan Co., 1948. 359 p. $5.00.

The author presents psychiatry in popular terminology. He integrates the innate drives of mankind with everyday experiences from birth as the basis of personality in the making. This is the greatest influence in the life of a human being. The personality force constitutes the aggregate of knowledge of ourselves as selves. The author reveals the various types of personalities in terms of body and mind and the troublesome traits that emerge from the lack of their integration. He reveals the nature of anxiety, fear, obsession, compulsion, mania, melancholia, schizophrenia and other disorders of personality. The remarkable thing about the presentation is the clarity with which these emotional concepts are presented as a basis of prevention and the conciseness with which the treatment is offered as a basis for cure. The book is addressed equally to the patient and the physician so that the psychiatric guidance may be more effective.

I. NEWTON KUGELMASS

Personality, A Systematic Theoretical and Factual Study. By Raymond B. Cattell, New York, N. Y. McGraw-Hill Book Co. 1950. 689 p. $6.00.

This monograph evaluates personality by the same scientific standards as are maintained in experimental psychology. Personality is evaluated in terms of types, traits and measurements. Emphasis is on precise methodology. The range of fields encompassed extend from psychoanalysis through anthropology and sociology. The author introduces the concept of Erg instead of instinct as the underlying basis of dynamic psychology. While the book was devised for teaching purposes, it presents a complete panorama of all aspects of personality invaluable in everyday practice of medicine.

I. NEWTON KUGELMASS

Textbook of Periodontia. By S. C. Miller, third edition. Blakiston, Phila., 1950. 900 pp., 586 illustrations. $11.50.

This new edition of an already distinguished work covers an exhaustive field in the rapidly maturing specialty of periodontics. From the new preface by its author, to its closing chapter on the presenting of periodontia to the patient, it is a comprehensive and coordinated attempt to fill a genuine need of the general practitioner of dentistry. This continues to be one of the best text books on the subject especially for the dental practitioner.

While not neglecting fundamental principles, it is thoroughly practical in its approach, bringing chairside periodontics up-to-date in its office application. Particularly appealing is the wise emphasis given to important details, often slighted in the usual course of therapy. This is another example of the painstaking thoroughness in evidence throughout the volume.

The text being coherent, thorough, and well-conceived, naturally is compactly organized. But it is just not a new edition of an old text. It is a fresh approach to an old problem. The biology and physiology of dentistry and dental practice are herein unfolded in all their basic significance and application. Five new chapters have been added. They deal with "Psychosomatic Relations in the Etiology of Periodontal Disease," "Choice of Treatment For Periodontal Pockets," "Restoration of Centric Occlusion and Repositioning of the Mandible by Equilibration of Occlusion," "Internal Medicine and Periodontal Disease," and "Periodontal Disease in Children." The excellent bibliography for suggested reading serves as a wide source of reference for those who may wish to delve deeper into particular areas of periodontal knowledge and practice.

To say that the text fills a real need of the general practitioner of dentistry is saying a great deal, but it does not say enough. The medical practitioner as well has become very much aware of it, particularly the specialist in the fields of ophthalmology, oto-rhino-laryngology, endocrinology, geriatrics, pediatrics and nutrition. It has advanced the science of oral medicine and continues to be one of the soundest authorities on the subject.

Miller, his associates at New York University College of Dentistry, and special contributors have marshalled a new work in the old tradition. It is the product of an alert and experienced group under an able leader, with a wide background of clinical experience. The book serves not only as a measure of progress attained, but also as a stimulus to further advances in the field.

JOSEPH J. OBST

MEDICAL VIEWS ON ORAL PROBLEMS

ORAL REACTIONS TO PENICILLIN TOOTH POWDER*

To the Editor: The currently fashionable use of highly potent allergic sensitizers in products available to the public now includes dentocillin.® This, according to the label, is a tooth powder containing 500 units per gram of crystalline potassium penicillin G and is produced by Andrew Jergens Company of Cincinnati.

We had our first case of urticaria medicamentosa due specifically to this product this morning. It follows the characteristic course seen following penicillin used in the customary manners. Urticaria appeared between 48 and 60 hours after initial brushing of the teeth with a "professional sample."

CLIFFORD H. KALB, M.D.,
161 West Wisconsin Avenue, Milwaukee.

* J.A.M.A., March 3, 1951.

DRYNESS OF THE MOUTH*

Dry mouth due to diminished secretion of saliva is a distressing condition. It may lead to redness, soreness and fissuring of the mucous membranes, with eventual atrophy. In severe cases rapid deterioration of the teeth follows. Chewing and swallowing may become difficult. Inadequate amounts of saliva may result from (1) a decrease in salivary gland substance (congenital hypoplasia, senile atrophy, destruction following surgical intervention, irradiation, inflammation or neoplastic infiltration); (2) disturbances of innervation (central or peripheral nerve lesions, emotional states, psychoses, interference with conduction of nerve impulses due to drugs, toxic agents or metabolic disturbances); (3) dehydration, and (4) unknown causes (Sjögren's syndrome). In Sjögren's syndrome dry mouth is associated with dryness of the eyes and mucous membranes of the nose, throat and vagina and with deficient gastric secretion. Many of these features suggest deficiencies of vitamin A, nicotinic acid and riboflavin and some of them are seen in pernicious anemia, iron deficiency anemia and Plummer-Vinson syndrome. There is a frequent association of the syndrome with rheumatoid arthritis and with the endocrine changes that occur in postmenopausal women. Treatment of dry mouth must be directed toward the causative factor.

* J.A.M.A., March 3, 1951.

FLUORIDE POISONING*

To the Editor: In Queries and Minor Notes in *The Journal,* Dec. 9, 1950 (page 1323), the answer to an inquiry concerning fluoride poisoning states that the chronic form of fluoride poisoning characterized by dense deposits in bones and tendons as revealed by roentgenograms is not known to have occured in the United States. This is incorrect. The following three cases are recorded in the literature as due to chronic fluoride exposure in the United States, and all were first revealed by roentgenographic study.

A case with bone changes in a laborer who had been exposed for 18 years to the dust of a fertilizer made by crushing of phosphate rock which had a high fluorine content (3.88 per cent) was reported by P. A. Bishop (Bone Changes in Chronic Fluoride Intoxication, Am. J. Roentgenol. 35:577 [May] 1936). Another case was due to chronic ingestion of high fluoride content drinking water (Linsman, J. F., and McMurray, C. A.: Fluoride Osteosclerosis from Drinking Water, Radiology 40:474 [May] 1943). In the latter case, the presence of bilateral chronic pyelonephritis was probably a factor in the production of skeletal sclerosis. The third case was also due to chronic ingestion of drinking water with a high fluoride content and is noted in the book "Neoplasms of Bone" by Bradley L. Coley New York, Paul B. Hoeber, Inc., 1949, pp. 657-658).

JOSEPH F. LINSMAN, M.D., California.

* J.A.M.A., March 3, 1951.

SWOLLEN LIPS*

To the Editor: A 43 year old male architect has greatly swollen lips, which itch and burn. The lips became swollen about Aug. 1, 1950, and became increasingly worse with no periodicity or remissions. Physical examination revealed no cause. There has been no change in residence or occupation. Needless to say, I have tested him for external contacts. He does not handle pencils, wood, crayon or ink. I have tried special diets.

M.D., Massachusetts.

ANSWER.—Gross swelling of the lips, with itching and burning but no necrosis, probably means angioneurotic edema despite the lack of remission. This "solid edema" is considered to be due to hypersensitivity, although it is described as a "symptom complex," and focal infection, endocrine disorders, infectious diseases and emotional disturbances have been incriminated. Drug idiosyncracy, even with a fixed eruption, is not probable but should be considered. It may occur after years of drug usage, and results of patch tests are often negative. Contact stomatitis is a similar, often localized, reaction, and results of patch tests are usually

positive. Lymphangiectasis is a soft yellowish swelling without inflammation or the sensory symptoms. The problem requires acute medical detection, and the questioner has made a good start. A few irritants or antigens that have been reported to be sometimes causative, but which are not mentioned in the question, are denture materials, alcohol-containing beverages, cosmetics of women outside the family, smoking and perhaps certain foods for which tests have not been made. Eosinophilia may be significant. Treatment must depend on solution of the complex problem of etiology, with symptomatic therapy used meanwhile. Epinephrine injection, ephedrine capsules and antihistamines (in the form of pills, capsules or ointments) may have both therapeutic and diagnostic value.

ASTHMA AND AMALGAM FILLINGS*

To the Editor: A woman aged 38 has had asthma for many years. She had many positive reactions to skin tests, and the disease was easily controlled. After she had six dental cavities filled, her asthma became severe, requiring constant symptomatic medication. Has a relation between mercury amalgam fillings and asthma been reported?

McKinley London, M.D., Cleveland.

Answer.—Allergy to mercury is not uncommon, and occasionally the source of this may be mercury amalgam. However, the allergic reactions from metallic mercury or inorganic salts of the latter are consistently those of contact allergy (e. g., dermatitis and stomatitis). Asthma from metallic mercury would be highly improbable in view of established experience and the accepted concept that metals or their inorganic salts do not ordinarily produce atopic manifestations (e. g., asthma and allergic rhinitis).

* J.A.M.A., April 14, 1951.

EXCESSIVE SALIVATION*

To the Editor: Is there any drug that will stop excessive salivation and drooling in a patient who has had a partial facial paralysis from a cerebral accident?

Michael C. Nash, M.D., Medford, Mass.

Answer.—Belladonna, atropine, scopolamine or stramonium will probably be found most effective in reducing the secretion of saliva. Banthine (50 mg. three times daily) might also be tried.

* J.A.M.A., April 14, 1951.

CANKER SORES*

To the Editor: I have been treating a 28 year old blond woman for aphthous stomatitis (canker sore) without success. She has had these sores most of her life and is almost never without them for longer than a week at a time. They are worse just before menses and usually occur in crops over the buccal mucosa, tongue and over the pharynx. The lesions consist of discrete, yellow, slightly elevated areas surrounded by a reddish border. I have treated her with biweekly vaccinations with smallpox vaccine, weekly injections of bismuth and oxophenarsine hydrochloride (mapharsen®) and 5 per cent sodium perborate mouth washes. The patient thinks there may be some improvement in the number and painfulness of the lesions, but they still occur with exasperating regularity. I should appreciate your recommendations.

J. P. Hodges, M.D., Center Point, Ala.

Answer.—Aphthous stomatitis always requires an allergic study. Most allergists agree that food allergy is the usual cause. Walnuts, spices and fruits are to be suspected; other foods commonly responsible for allergy must be considered. Because of the usual impossibility of determining clinical food allergy with skin tests Rowe (Elimination Diets and the Patient's Allergies, ed. 2, Philadelphia, Lea & Febiger, 1944) has long prescribed his fruit-free elimination diet, which excludes all fruits, milk, eggs, wheat, chocolate, spices and certain other foods, when canker sores and, in fact, other gastrointestinal allergies occur. He holds that the unfortunate delay in recognition of food allergy as a common cause of canker sores and other gastrointestinal allergy is due to the failure to realize the fallibility of the skin test in the determination of such allergy and failure to use trial diets accurately for the study of such allergy. The published menus and recipes for bakery products for this diet must be used. No trace of the suspected food can be taken, and satisfactory weight must be maintained with the foods in the diet. If constant canker sores are present, relief in two to three weeks, lasting for one to two weeks, indicates exclusion of allergenic causative foods. If attacks occur every two to six weeks, then relief must continue while the elimination diet is used for at least twice as long as previous periods of intervening relief. When relief is assured, the individual foods can be added, each being eaten daily for five to seven days before another is added. Foods that cause the lesions to recur must be excluded, usually for months or even for longer periods, before tolerance for them returns.

Canker sores also occur from allergy to various drugs and occasionally to allergens in dentifrices and ingredients of mouth washes. Bacterial allergy may be a rare cause, as suggested by crops of such lesions following injections of certain vaccines and relief of such lesions when foci of infection are removed. The possibility of an electrolytic reaction between gold and amalgam fillings has been suggested in the

literature. Canker sores occur, moreover, in debilitated patients, but in them the major cause may be food allergy.

In almost all patients with aphthous stomatitis, other oral allergic reactions, gastric distention, substernal soreness and fulness, nausea, vomiting, abdominal soreness, pain or distress, diarrhea, mucous colitis, constipation or other gastrointestinal symptoms usually due to food allergy exist. Of course all other causes of such gastrointestinal symptoms must be thoroughly ruled out by indicated laboratory investigations and roentgen ray studies and physical examination. Moreover, other recognized manifestations of allergy may be present. Usually the dietary history, or, occasionally, the drug history reveals evidence of possible food or drug allergy. In rare cases, canker sores with or without allergic stomatitis, glossitis or pharyngitis may be the only manifestation of clinical allergy.

In view of the failure of the medicaments mentioned in the query, this study of allergy, especially to foods, is required. This must be accurately done, however, for dependable results.

* J.A.M.A., May 5, 1951.

FOOD ACIDS AND CARIES*

The concept that acid erosion is the fundamental cause of dental caries was advanced more than half a century ago. Further experimental evidence supporting this hypothesis was recently presented. From a microbiologic point of view, the demonstration[1] of the high acidophilus count in carious mouths was of great significance, since it revealed a mechanism for the production of acid food residues. Another important observation was that in a group of children the only significant difference between the composition of the saliva of caries-free and of carious mouths was the strikingly higher buffer capacity of the former.[2] In line with this finding was the demonstration[3] that removal of the salivary glands in rats resulted in severe hypertrophic gingivitis and caries on the exposed surfaces of the molars in less than three weeks.

Improved technics for experimental study of caries have been introduced recently. The Syrian hamster has been used widely as an experimental animal, since it was shown to have a tooth structure more like that of human teeth than that of other rodents.[4] Ordinarily the common laboratory albino rat is not readily susceptible to caries, the cotton rat being more useful in studies of this disease.[5] However, if the mothers of young albino rats are restricted to purified caries-producing rations during pregnancy and lactation, their progeny become as susceptible to tooth decay[6] as the cotton rat. That contact of food with the tooth surface is a prerequisite for caries production seems clear from an investigation[7] in which a caries-producing ration was fed to young rats through a stomach tube. While lesions developed in all of the control group eating the diet, the rats receiving the food through the tube were not affected.

"Soft" drinks, which usually contain a considerable concentration of organic acid in addition to flavoring, sugar and carbon dioxide, and acid-sugar combinations that simulate "soft" drinks, produce etching of the enamel and dentine of the teeth of laboratory rats, hamsters and dogs.[8] Apparently the acid attack is a function of the titratable acidity of the beverage rather than the *p*H, while the buffering action of the saliva[9] serves to oppose the erosive action. Acid fruit juices have been recently implicated, and the citrate ion seems particularly prone to produce dental lesions. In one study,[10] apple, grape, pineapple, orange and grapefruit juices produced pronounced erosion of the lower molars in the albino rat while tomato and prune juices had a much milder action. A recent investigation[11] of Polynesian fruits—grapefruit, guava, Java plum, mango and pineapple—confirmed the erosive action of acid fruit juices on dental enamel, but when an equivalent amount of the fruit itself was consumed there was much less etching of the tooth substance.

The role of nutrition in the etiology of dental caries has received considerable attention, and vitamins and minerals have been regarded as factors specially involved in dental health. Although there are doubtless nutritional and metabolic factors favoring the development and integrity of the teeth, the presence of acidity, either preformed in food touching the surface of the teeth or developed by bacterial degradation of food residues in the crevices around the teeth, appears to be a prominent factor in the erosion of the enamel and dentine.

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* J.A.M.A. Editorial, Feb. 3, 1951.

ANNOUNCEMENTS

Special Announcement

New York University College of Dentistry

This school offers a one year full time course covering all phases of periodontal diagnosis and treatment, including conservative and radical technics and equilibration of occlusion. Each registrant must acquire sufficient clinical experience to prvoe his skill in the handling of all phases of periodontal disease. He is also required to prepare an original thesis on a phase of the subject, this is to be presented before the class for discussion. Courses in periodontia are under the supervision of Professor Samuel C. Miller.

One academic year daily, Monday through Friday, 9 A.M. to 4 P.M. Limited to 4. Tuition $1,000.00. Books $29.50. Instruments approximately $100.00. Rental fee $1:00.

For information and application write to Secretary of Postgraduate Division—New York University College of Dentistry—209 East 23rd Street, New York 10, N. Y.

Seminar on Dental Medicine

The Eighth Annual Seminar for the Study and Practice of Dental Medicine, will be held in Palm Springs, California from October 28 through November 1, 1951.

Faculty members will participate in a series of lectures on current medical findings as related to dental health. Informal small group discussions will also be conducted during the meeting.

Dr. Becks, president, announced that one of the highlights of this year's Seminar will be the inclusion of a Paradentopathies Workshop. The entire Seminar attendance will be divided into study groups, each working on a particular phase of the problem, with a final report being given on the subject on October 31.

Lecturers include: William A. Albrecht, Ph.D., Professor of Soils and Chairman of the Department at the University of Missouri, College of Agriculture; Seymour M. Farber, M.D., Division of Medicine of the University of California Medical School, and in charge of the University of California Tuberculosis Service at the San Francisco Hospital; Dr. L. S. Fosdick, Professor of Chemistry, Northwestern University, and President-Elect of the International Association for Dental Research; Theodor Rosebury, D.D.S., Professor and Head of the Department of Bacteriology, School of Dentistry, Washington University, St. Louis; David B. Scott, D.D.S., M.S., National Institute of Dental Research, the National Institute of Health, Bethesda, Md.; Harry Shwachman, M.D., Director of the Clinical Laboratory, and in charge of the Chronic Nutrition Clinic, Children's Medical Center, Boston; and Norman S. Simmons, D.M.D., Chief, Enzyme Chemistry Section, Atomic Energy Project, University of California in Los Angeles.

Attendance for participation in this Seminar is limited to members in good standing of the A.D.A., A.M.A., or comparable groups.

New Seminar applicants must comply with the following requirements: 1. A case report; or 2. A post-graduate course in the basic sciences between October, 1950 and October, 1951; or 3. An abstract of a publication on any of the subjects to be presented at the coming Seminar. Literature references will be forwarded upon request.

Registration, lodging and meals for the five days of the Seminar are included in the total fee of $150.

Detailed information may be obtained from Miss Marion G. Lewis, Executive Secretary, Room 200, Hooper Foundation, University of California Medical Center, San Francisco 22, California.

Hans Selye to Speak at New York Institute of Clinical Oral Pathology

The New York Institute of Clincal Oral Pathology announces a meeting which will be open to the dental, medical and allied professions in celebration of its One Hundred and Fiftieth Monthly Conference, to be held in Hosack Hall, The New York Academy of Medicine, 2 East 103rd Street, on Monday evening, October 29, 1951 at 8:30 P.M. promptly.

For the occasion the Institute has invited Doctor Hans Selye, Professor and Director of the Institute of Experimental Medicine and Surgery, University of Montreal, to be our essayist on the subject, ROLE OF GENERAL-ADAPTATION-SYNDROME IN ORAL PATHOLOGY (with special reference to hormone treatment).